



05-14-53

PATENT
Attorney Docket No. 2269-3027.2 (96-684.1)

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Serial No.: 09/259,145

Group Art Unit No.: 2814

Filing date: February 26, 1999

Examiner: Anh D. Mai

For (title): WELL-DRIVE ANNEAL TECHNIQUE
USING PREPLACEMENT OF NITRIDE
FILMS FOR ENHANCED FIELD
ISOLATION

TRANSMITTAL OF REPLY BRIEF

Commissioner of Patents and Trademarks

P. O. Box 1450

Alexandria, Virginia 22313-1450

Sir:

Transmitted herewith in triplicate is the REPLY BRIEF in this application with respect to the Examiner's Answer dated March 24, 2003.

Any fees which are not otherwise submitted herewith or which are insufficient should be charged to deposit account no. 20-1469. A duplicate copy of this notice is enclosed. Please address all communications in connection with this appeal to the address indicated below.

Respectfully submitted,

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Date: May 13, 2003

Enclosures: As identified above



#41 Reply
Brief
8/11/03
Answer

Serial No. 09/259,145

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Pan et al.

Serial No.: 09/259,145

Filed: February 25, 1999

For: WELL-DRIVE ANNEAL
TECHNIQUE USING PREPLACEMENT
OF NITRIDE FILMS FOR ENHANCED
FIELD ISOLATION

Examiner: Anh D. Mai

Group Art Unit: 2814

Attorney Docket No.: 3027.2US (96-684.1)

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REPLY BRIEF

Assistant Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
Attention: Board of Patent Appeals and Interferences

Sir:

Pursuant to 37 C.F.R. §1.193(b)(1), this Reply Brief is filed in triplicate in response to the Examiner's Answer mailed on March 24, 2003. This Reply Brief is submitted within two months of the mailing date of the Examiner's Answer pursuant to 37 C.F.R. §1.193(b)(1).

APPELLANTS' REPLY TO EXAMINER'S RESPONSE TO ARGUMENT

As set forth in Appellants' Appeal Brief, Appellants maintain that the Examiner has failed to establish a motivation to combine the cited references upon which the Examiner relies. Appellants respectfully submit that the motivation proposed by the Examiner is improper and, therefore, does not establish a *prima facie* case of obviousness. The Examiner's proposed motivation is improper because the cited references and the knowledge of one of ordinary skill in the art do not provide any motivation to produce the claimed invention. In addition, the Examiner has not provided objective evidence in support of the proposed motivation.

Rejection of Claims 25, 26, 31, 33, 34, 37-40, and 43-48 under 35 U.S.C. § 103

Claims 25, 26, 31, 33, 34, 37-40, and 43-48 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Tada in view of Koike. In addition, the Examiner has rejected these claims, for the first time, under Wolf *et al.* While Wolf *et al.* has been referenced by the Examiner in previous Office Actions as providing background information, the reference has never been used to reject the claims. Appellants submit that Tada and Koike do not provide a motivation to combine to produce the invention of the rejected claims. Additionally, the cited sections of Wolf *et al.* do not provide a motivation to combine to produce the invention of the rejected claims.

The Examiner states that it would have been obvious to one of ordinary skill in the art to encapsulate the semiconductor substrate of Tada to prevent the second surface from oxidizing. Examiner's Answer, page 7. However, as explained in Appellants' Appeal Brief, nothing in

Tada or Koike teaches or suggests preventing oxidation of the surface of the semiconductor substrate or suggests that encapsulating the semiconductor substrate would solve this problem. The substrate in Tada is not encapsulated while the substrate in Koike is encapsulated to protect the gettering properties of the underlying silicon thin film layer until the manufacturing process is complete. Therefore, one of ordinary skill in the art would not be motivated to combine the cited references to produce the claimed invention to prevent oxidation on the surface of the semiconductor substrate, as asserted by the Examiner.

The claimed invention also does not disclose that its semiconductor substrate is encapsulated to prevent oxidation of the surface. Rather than preventing oxidation, the claimed invention reduces the encroachment of field oxide structures. Nothing in Tada and Koike teaches or suggests reducing encroachment of field isolation structures and, therefore, one of ordinary skill in the art would not have been motivated to combine the cited references to produce the claimed invention.

The Examiner cites to Wolf *et al.* in support of the assertion that the substrate is annealed to activate the dopants. Examiner's Answer, p. 4-5. However, nothing in the cited sections of Wolf *et al.* provides any motivation to combine with Tada and Koike. In other words, nothing in the cited sections of Wolf *et al.* cures the previously discussed deficiencies in Tada and Koike.

Appellants also note that the Examiner mischaracterizes Appellants' arguments. Appellants acknowledge that Koike discloses that its silicon nitride film extends over the first and second surfaces of its substrate to render gettering properties to the underlying silicon thin film. However, this does not provide the requisite motivation to combine the cited references

because Koike does not suggest the desirability of, or provide an objective reason for, forming a silicon nitride layer on both surfaces of other semiconductor substrates, such as the semiconductor substrate in Tada.

Furthermore, contrary to the directive in *In re Lee*, 61 U.S.P.Q.2d 1430, 277 F.3d 1338, 1342 (Fed.Cir. 2002), the Examiner's statement that it would be obvious to encapsulate the semiconductor substrate of Tada to prevent the second surface from oxidizing is conclusory and is not based on any findings or rationale. The Examiner has not presented any objective evidence that one of ordinary skill in the art would have been motivated to combine the cited references to produce the claimed invention. Rather, in every office action detailing this rejection, including the Examiner's Answer, the Examiner has stated, conclusorily, that the combination would have been obvious to prevent the second surface from oxidizing although none of the cited references provide such a motivation.

In addition to providing no motivation to combine, the cited references do not teach or suggest all the limitations of the claimed invention. As acknowledged by the examiner, Tada does not teach or suggest a substantially dopant-free, uninterrupted diffusion barrier layer that extends over the second surface of the substrate. Office Action of July 29, 2002, page 3. Appellants respectfully submit that Tada also does not teach or suggest a substantially dopant-free, uninterrupted diffusion barrier layer that extends over the first surface of the substrate, for the reasons explained in Appellants' Appeal Brief.

Contrary to the Examiner's assertions, Appellant is not arguing "that Tada does not teach a barrier layer." Examiner's Answer, p. 6. Rather, Appellant is arguing that Tada does not teach

or suggest "a substantially dopant-free, uninterrupted diffusion barrier layer extending over said first surface," as recited in claims 25, 33, 39, and 46. As explained in Appellants' Appeal Brief, the base oxide film in Tada is not a barrier layer and is not dopant-free because it is formed on the semiconductor substrate before the diffusion layers are formed. In addition, the diffusion layers are interrupted layers that do not extend over either a first surface or a second surface of the semiconductor substrate.

Since Tada does not teach or suggest that the substantially dopant-free, uninterrupted diffusion barrier layers extend over the first or second surfaces of the substrate, Tada does not disclose that the semiconductor substrate is encapsulated.

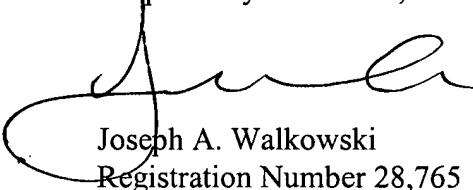
Rejection of Claims 32 and 49 under 35 U.S.C. § 103

Claims 32 and 49 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Tada and Koike and further in view of Shim. Appellants submit that neither of Tada or Koike provides a motivation to combine the cited references to produce the invention of the rejected claims for the reasons previously discussed. In addition, Shim does not cure the deficiencies in Tada or Koike for the reasons presented in Appellants' Appeal Brief.

CONCLUSION

Pursuant to 37 C.F.R. §1.193(b)(1), Appellants respectfully request acknowledgement of receipt and entry of this Reply Brief.

Respectfully Submitted,



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Date: May 13, 2003
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